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RECENT ADVANCES IN OUR KNOWLEDGE OF POULTRY DISEASES

*(Three Lectures at the Imperial College of Science)**

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HENRY GEORGE PLIMMER FELLOW IN PATHOLOGY

Lecture III.—Fowl-pox and Fowl Canker; Coccidiosis

In the two previous lectures reference has been made to initial experiments and observations on birds which have eventually resulted in remarkable advances in general biological knowledge; which in the course of time became applicable to the practical needs of poultry farming. Then it was suggested that since avian morbid anatomy evinces peculiarities and characters the exact analogy of which is not to be found in man or other mammals, it would be advisable to study it as a separate unit, though within the ambit of comparative pathology.

As examples of these general observations, the life cycle of the tapeworm *Davainea proglottina* in the brown slug, *Agriolimax agrestis*, was illustrated in view of its practical importance; this was followed by a discussion of the pathology and treatment of fowl paralysis, or neurolymphomatosis. The latter disease is peculiar to the domesticated fowl and cannot be said to exhibit more than a certain superficial resemblance to any ailment in man or other mammal. It is not due to a neuro-tropic "virus," but if caused by a virus at all, this evinces proliferative lymphocytotropic properties, that is, causes the increase of cells of the lymphocyte series, which then settle in the peripheral nerves.

In the second lecture a consideration of the vitamins was introduced, not only because progress in relation to these essential food elements has recently been particularly rapid, but also since the influence of vitamins is far reaching in relation to poultry nutrition. Indeed, it did not appear feasible to illustrate the influence that nutrition exerts in relation to certain diseases of poultry, without constant reference to the nature and action of vitamins, a subject which deserves more than a cursory review of contemporary researches.

* Lectures Nos. I and II appeared in our issues of July 15th and August 12th, respectively.

Now two diseases will be taken into consideration, which, though both peculiar to the domesticated fowl, nevertheless present striking resemblances to certain ailments in man and such occurring in sheep and other animals. The diseases are fowl-pox and fowl canker, associated conditions both caused by a "virus" belonging to the variola-vaccinia group; then coccidiosis, the ravages of which are due to the multiplication of a small oval protozoon. Though so different in pathology and etiology, both ailments are influenced considerably by nutritional conditions and, moreover, have lately been the subject of study which should enable these conditions to be treated and prevented more successfully than hitherto.

Fowl-pox (Epitheliosis contagiosa) and Fowl Canker (Purulent epitheliosis)

These two ailments, which differ considerably in outward appearance, are bracketed together because they are manifestations of the morbid conditions induced by the action of the same "virus." In fowl-pox the virus acts on the epithelium of the skin; in canker the lesions develop on mucous membranes. The characters of fowl-pox and canker are easily described; fowl-pox consists of dry, dark warts making their appearance on the skin with a particular predilection for folds or corners or exposed parts, such as the comb. Canker is etiologically the same lesion when it develops on a moist mucous membrane, such as the lining of the roof of the mouth, throat, or inner lining of the eye cavity or sinuses. In both conditions in the first instance the epithelial cells become hypertrophic, resulting in a circumscribed proliferation which in fowl-pox develops as a warty excrescence, which eventually dries up and falls off. The same lesion on a mucous membrane undergoes a process of moist necrosis, or maceration, in which numerous putrefying bacteria take an active part and produce a cheesy, pultaceous, evil-smelling mass of yellowish material.

FOWL-POX AND CANKER OF EYE.

CAUSATION.—This is no longer in doubt; the causal agent is a filterable "virus" which shows several resemblances to those of small-pox and vaccinia. It differs somewhat from that of small-pox and vaccinia, in so far that the "virus" of fowl-pox is specific for *Gallus domesticus*, whilst vaccinia, or certain strains of it, is communicable with greater or less success to many mammals.

The existence of a specific pigeon "virus"

DEPT. OF VET. MEDICINE

Fowl-pox lesions of skin and canker of eye in a Rhode Island Red hen from a farm where feeding was low (not deficient) in Vitamin A. The outbreak involved over a hundred birds.

(Photograph by Turner and Son, Cambridge.)

should be mentioned, since it is used as an immunising agent against fowl-pox in a manner very similar to the practice of vaccination in man. The " virus " of fowl-pox will not cause lesions in the pigeon, whilst the pigeon-pox " virus " will induce warts in the fowl. A gradual adaptation of the fowl-pox virus to pigeons appears possible, but it is a gradual and reversible process.

In common with many other " viruses," that of fowl-pox can be killed by heating at 60°C. for an hour; is destroyed by antiseptics, particularly oxidants, like potassium permanganate. It is filterable, that is, an active solution, capable of producing lesions in fowls, will be obtained through a diatomaceous candle capable of retaining the larger bacteria; in being filtered it loses a great deal of its virulence. It can be artificially cultivated in the presence of viable cells; its multiplication outside living cells is doubtful.

Appearances of an Outbreak.—The appearance and spread of fowl-pox and fowl canker are usually sudden; many times their introduction can be traced; at other times it is mysterious. Though farmers are inclined to blame game, such as pheasants, or wild birds, like starlings or sparrows, for the origin of outbreaks, it is difficult to admit such means, when there are the possibilities of soiled crates, second-hand utensils, etc., to take into consideration. The sudden spread is also a matter which requires explanation, for at least in some instances, where the disease has taken heavy toll of the fowls, the condition became at first noticeable for some time before, in the form of frothy eyes and light forms of canker; such discrete attacks continued for a couple of weeks and then warts and severe cankers became numerous. Such a sequence of events will be quite understandable if one considers the enormous multiplication of infectious material which develops when a " virus " takes a hold in a living host cell. For similar reasons, one may prove how important it is to keep close watch even on slight ailments of fowls, if one wishes to avoid the spread of severe epizoötics.

Individual Treatment.—This is similar for both conditions and can be said to be effective. The first step is prompt segregation of all affected fowls in a run separated by means of wire netting from the remaining healthy birds. Where birds are huddled together the disease spreads more easily. Among my experimental birds cross-infection has been rare. Then the lesions of the diseased fowls should be wiped with a pellet of cotton-wool dipped in tincture of iodine.

In severe canker the loss of an eye is a common occurrence; a sinus which has been lanced can soon fill again. Mortality can be heavy, but here again, as in other instances, malnutrition plays a great part in the aggravation of the symptoms.

Disinfection of Premises, Appliances and Soil.—Disinfection on the general lines which are usual in relation to most outbreaks of infectious disease, can be suggested. The use of antiseptics in the drinking water is useless and may be harmful.

The Value of Preventive Immunisation.—This has lately been extensively practised and it can be stated to show uniformly good results. The immunising substance is obtained from the dry crusts of the lesions of pigeons artificially infected with a pigeon " virus "; these are collected about the ninth to twelfth day, ground to powder and suspended in an 80 per cent. glycerine solution in physiological saline. This emulsion is applied with a stiff brush on the thigh, which has been previously plucked; the follicles then swell up about the fourth to fifth day and subside in five days to a week. By such means the disease can be kept in check for six months to a year.

Immunisation is not a curative measure; if the disease is in course of development in any fowl, it will not be stopped in its course by the "vaccination"; for immunity is not very evident till a fortnight after the " vaccination." When large numbers are dealt with, about 1-3 per cent. will not " take " and may have to be vaccinated again; if even then the repeated inoculation does not show a cutaneous reaction, one may admit that birds have either already withstood the disease or are perhaps naturally immune. Amongst the fowls which have been

properly inoculated, not more than 3 per cent. should develop fowl-pox, even if in contact with diseased birds. If a greater percentage is present, then either the potency of the "vaccine" or the manner of its application is at fault. Such measures do not, of course, exclude the necessity of ridding the premises of any source of infection by a general clean-up.

I have practised preventive inoculation by means of a " virus " prepared from the crusts in the acute outbreak.

The inoculation by means of a " virus " obtained during the actual outbreak, though apparently more logical, is not without danger, owing to spread of bacterial infections. Where fowls have an abundant free range, spread of the infection can be stopped by picking out all birds which show lesions and giving full space to others.

Lesional Differentiation Factors. — The striking difference between fowl-pox and fowl canker, notwithstanding their common etiology, has been a puzzling feature on the several occasions I have encountered it. Only lately, on closer observation, it became evident that the localisation of the lesions, as also the mortality, was definitely influenced by the nutrition, particularly in relation to vitamin A requirements; on poultry farms where feeding was deficient, canker and not fowl-pox was common. The resemblance between avitaminosis A and incipient canker is great and it seems reasonable to consider that where the deficiency prepares the lesion, the " virus " will settle more easily, as indeed it does also in relation to mechanical injuries, produced by different irritative means.

Coccidiosis in the Domesticated Fowl

That coccidiosis is a dangerous ailment of chicks is well known to most poultry farmers, who, moreover, are aware that the disease differs from white scour or bacillary white diarrhœa. The latter is the result of the infection with the bacterium *Salmonella pullorum*, whilst coccidiosis is the outcome of the multiplication in the wall of the bowel of a protozoon known as *Eimeria avium*, originally accurately described by Rivolta in 1878, who recognised its pathogenic importance as a cause of anæmia.

Diseases caused by coccidia not only occur in other birds but also in guinea-pigs, rabbits, sheep and many other animals; the coccidia which cause disease in the domesticated fowl are, however, specific for the fowl, because one cannot cause disease in a rabbit by feeding it with coccidia from a fowl; *vice-versa*, one cannot cause coccidiosis to develop in a fowl by feeding it with the coccidia from a rabbit. The practical importance of these observations consists in this: that there is no correlation between the presence of wild rabbits, which harbour coccidia very frequently, and coccidiosis in poultry.

Though, as said, the cause of coccidiosis in fowls was discovered in the last quarter of last century, yet the disease has become a serious menace to poultry farming only in recent years. One may surmise the aggravation of coccidiosis to be the result of the extent of the intensive system of poultry farming; the rapid growth of which has outstripped research in relation to the diseases which are intensified by overcrowding and overbreeding—and, one may add, underfeeding—all of which necessarily may occur under commercial conditions. These adverse circumstances cannot but influence the spread and mortality due to coccidiosis and other infectious conditions.

The reason of the comparative neglect of the study of coccidiosis in the past is possibly the fact that acute and chronic coccidiosis, though present, may pass unnoticed in free range fowls, in any case as far as acute mortality is concerned.

It is only when space becomes restricted, the soil correspondingly heavily fouled and reinfection a constant feature, that coccidiosis becomes a veritable danger, particularly if, in addition, as is often the case, low-grade feeding stuffs are employed. To all this may be added the fact that the recognition of fowl coccidiosis requires skilled microscopical examination, if starch cells or blastocysts or encysted protozoa are not to be mistaken for coccidia.

Incidence and Spread of Coccidiosis.—The losses through the action of coccidiosis, direct and indirect, must be very large indeed, for they are continuous and take place on many farms. Coccidia were found in large or small numbers in 40 per cent. of the necropsies performed during these last two years; one must not conclude that the death of this percentage of fowls was due to coccidia—the proportion where coccidia could be incriminated for the development of the pathological condition was much lower—something like a third of the infestation rate mentioned.

Semi-intensively kept fowls are more frequently affected, but coccidiosis is by no means unknown where fowls are kept on a full intensive system, for the conditions are usually even more favourable for the spread of a parasite which is picked up from the droppings.

The Symptoms of Coccidiosis in Chicks.—These are well-known and consist in the chicks appearing drowsy, their wings drooping and the feathers becoming ruffled; blood-streaked droppings are soon noticeable and soil the fluff around the vent. The chicks should then immediately be singled out and killed; on examination of the bowels both cæca will be found swollen, enlarged, purple or even black. On incision a jelly-like mass of serum and blood protrudes or the contents consist of clotted blood. Microscopical examination should reveal the coccidia

in thousands, but in early cases they are scanty and it may be necessary to scrape the walls of the gut to find evidence of coccidia. Though mortality is always heavy, a certain number of chicks which show symptoms of coccidiosis may recover; these, however, should be closely watched, because they are potential disseminators of coccidiosis through their droppings.

Chronic Form in Pullets.—This is usually recognisable by a general unthriftiness of the birds affected, which appear undersized, with ruffled feathers, their vent soiled; the birds are not lively, appearing indolent or even drowsy. These are the general appearances of chronic coccidiosis in the adult, but it must be understood that it does happen that a fowl, showing relatively numerous coccidia in its cæcum, may appear outwardly quite healthy, though its performance in egg-laying or weight increase will be under the average. This may be particularly the case on farms where feeding and management are good.

Paralysis Occurring as the Result of Chronic Coccidiosis.—This is probably the form which is more often confused with neuro-lymphomatosis, for this reason—that the gross symptoms are similar and few have the time and patience to carry out the prolonged microscopical examinations which are essential to discriminate between both diseases. For these reasons it is dangerous to rely on the appearance of gross lesions seen in the course of *post-mortem* examinations, however skilful and experienced the observer. It is not to be wondered at that severe outbreaks of coccidiosis and coccidiosis alone have been repeatedly diagnosed as "fowl-paralysis"; so that whilst the alleged paralysis was being investigated with all the resources available to science, the poultry stock died off in hundreds as the result of coccidiosis pure and simple.

To avoid similar diagnostic errors, one may suggest that the significance of coccidia in the duodenum, ileum or cæca should be considered in the first instance before the diagnosis neuro-lymphomatosis is made, which should be based, above all, on the typical lesions in the nerves. The appearance of the birds is not without importance, for the scraggy, unkempt, soiled look of poultry speaks for coccidiosis and against neuro-lymphomatosis.

The intestinal lesions of coccidiosis are not always evident to the naked eye, particularly in chronic cases; microscopically, in the nerves a slight degree of peri-vascular infiltration with lymphoidal cells is not infrequent; this should not be confused with the massive and diffuse interstitial accumulation of cells occurring in neuro-lymphomatosis.

Obviously, neuro-lymphomatosis and coccidiosis may well occur in the same bird; but the conditions are etiologically and pathologically distinct and should be considered apart.

Etiology.—The immediate causative agent of coccidiosis is a microscopical oval protozoon. Recent work by Tyzzer (1932) and others appears to indicate that, in the United States at least, coccidiosis in the domesticated fowl may be due to several coccidia; six species have been distinguished morphologically and experimentally. These have been named: *Eimeria tenella; E. acervulina; E. maxima; E. mitis.* To these were then added, in confirmation of work by Johnson (1930), *E. præcox, E. necatrix.* According to these authors, the lesions induced in the intestinal tract by these different coccidia vary greatly in intensity and also in localisation. Some coccidia penetrate deep into the walls of the bowel, where they multiply and eventually burst out into the lumen, causing a severe lesion of the tissues and a consequent loss of blood. Others, however, keep to the superficial layers of the villi and thus do not cause great damage or are even practically innocuous.

Experimental Evidence for and Against the Plurality of Fowl Coccidia.—The investigations of Tyzzer in relation to the fowl coccidia in the United States are of great practical importance, but their confirmation requires an expenditure in appliances and personnel which I have been unable to achieve. The reason is that under laboratory conditions, cross-infestations with coccidia occur with the greatest ease, not only from one cage to another in the same room, but even if the same attendant looks after the birds in separate rooms on different floors. For this reason, even after feeding chicks with counted coccidia from a definite source, one cannot feel sure that the coccidiosis developing is due to the experimental infestation. Given the necessary means, the technical difficulties are by no means unsurmountable.

These different localisations can be observed in fowls in this country, but without a series of strictly controlled experiments it is impossible to state whether such variations in pathology are due to differences in species or are rather to be considered as the result of natural variations in the effects of the host-parasite relationship: otherwise expressed, whether the same species of coccidium may not invade the bowel lining more or less deeply according to the age and resistance of different fowls.

Life Cycle of *Eimeria tenella*, According to Tyzzer (1929).—This differs somewhat from the descriptions of previous authors and is here quoted as an example.

An infected chick or fowl passes very numerous oöcysts in its droppings; these are particularly resistant and encased in a thin shell. Given suitable moisture and warmth conditions, four spores develop and if the cyst is then ingested by a chick, on reaching the

duodenum the shell is dissolved and the spores released and from each of these, two actively motile sporozoöites emerge and penetrate the cells of the intestinal epithelium. Here they multiply actively, becoming thinner and more elongated within a large clump, the schizont; these merozoites, or division products, eventually are liberated into the lumen of the duodenum, leaving behind an appreciable scar. These merozoites are scattered in the contents of the duodenum and carried on with the intestinal contents and so reach the cæca, where they again penetrate the epithelial lining and go through a similar process of schizogony or asexual multiplication which is repeated, each time with a somewhat smaller number of merozoites. The merozoites of the third generation are not numerous and it is probable that now they go through a process of sexual reproduction or gametogony, when mother-cells, or macrogametocytes, and male cells, or microgametocytes, are differentiated. The mother cell gives rise to a daughter cell, or macrogamete, whilst the male cell produces many biflagellate active microgametes; these fertilise the macrogamete by penetrating it at thin spot, the micropile. The nuclei of the two gametes then conjugate, and the fertilised product (the zygote) becomes soon surrounded by a membrane and is then known as the oöcyst, or egg-cyst. These oöcysts are passed in the droppings in enormous numbers and when picked up by a chick go through the development which has already been described. It will be seen that this description postulates a duplicated schizogony; first in the duodenum and then in the cæcal pouches.

Resistance of the Oöcysts to Antiseptics.—It should be understood that the oöcysts are particularly resistant to antiseptics and disinfectants as long as they are enclosed in their shell. Droppings containing oöcysts can be placed on blotting paper and this can then be dropped into a dish with 1/1,000 corrosive sublimate solution or concentrated picric acid and yet development into sporoblasts will take place as usual. Obviously, if the sporoblasts were liberated, then the antiseptics would kill them.

It is this peculiar resistance of the shell that makes ordinary precautions so difficult to carry out.

I may be allowed to explain that whilst I have not had opportunity to carry out experimental work, the prevention and control of coccidiosis has been my constant care for some considerable time: partly in my experimental fowls, because the ailment is constantly re-introduced by fowls which are sent to the Institute as suffering from fowl-paralysis, and secondly because I meet the disease so often under different farming conditions. In my own personal experience fowls on free range will show coccidia in the cæca with astonishing frequency, without being particularly troubled by the infestation. This is a common observation in relation to wild game and the most diverse parasites, such as helminths or even trypanosomes.

Transmission of Coccidiosis through the Egg.—Since coccidia are restricted to the walls and contents of the bowels and, moreover, are not actively motile, there does not appear any possibility of their being enclosed in eggs: the contamination of the shell by means of fæcal matter containing coccidia can be considered. It is for this reason that Kaupp (1933) recommends the washing of eggs with absolute alcohol. This expensive precaution does not, however, appear necessary, since experiments by Professor David E. Warner [in Tyzzer (1932)] show that under incubator conditions coccidia on the shell surface will soon dry and become incapable of infecting.

Survival of Coccidia in the Soil.—As a general rule, it is considered that coccidia will remain infective in droppings on soil exposed to the open air over a season at least. Conclusive experiments in this connection are not easy to devise and instances have been brought to my notice where particular plots of ground have been said to remain capable of transmitting coccidiosis year after year. Practical experience with coccidiosis has persuaded me that the living carrier of coccidia is the greatest danger for the continuation of the infestation from season to season and that the avoidance of immediate and remote re-infection is the key to the problem and that therefore simple precautions are sufficient in regard to the soil. In relation to this particular problem, Professor David E. Warner, in the U.S.A., was unable to bring about infection with soil from runs which had been occupied by an infected flock up to 50 days prior to the test feeding.

COCCIDIOSIS AND VITAMIN A

As the result of several observations made in the field, the influence of the lack of vitamin A in foodstuffs on the severity of the after-effects of coccidiosis appeared evident under ordinary poultry farming conditions, so that I decided to test and measure this effect by means of laboratory experiments.

In the first instance, for this purpose, 50 cockerels were purchased from a farm on which coccidiosis was present under free range conditions. These two-month-old birds were penned up and fed on bran alone, which they eat greedily. After three weeks the birds began dying, and though coccidia were present in the bowels, yet the anatomical lesions in the pharynx and kidneys pointed more definitely to the results of vitamin A deficiency. At the end of three months only three birds survived, undersized but relatively active. These were killed and showed no coccidia and no lesions which could

be attributed to lack of vitamin A. The control birds, both cockerels and pullets, on the farm were not kept for the whole three months, but during the period of observation (two months), the dead birds numbered eight. The indications of these and similar tests could not be practically applied, because bran alone is not usually employed as a food for poultry and, moreover, it was quite evident that such a severe degree of avitaminosis had developed as to mask the evil effects of the coccidiosis. Therefore a further series of tests was devised. Batches of day-old-chicks from reputable breeders were kept during nine weeks in brooders and then placed on land in folding pens, together with chicks of the same age known to harbour coccidia. Both in the brooder and on the land they were fed on mashes and corn mixtures rich in vitamin A. As a control, similar batches were kept during nine weeks in pens and fed on mashes with a low content of vitamin A. Here again, the difference in mortality between the two lots was striking, though it must be admitted that the facility for re-infection in the penned birds was a disturbing factor which is being eliminated in further tests. In any case, the mortality which could be attributed to coccidiosis in the birds suitably fed in folding pens was five out of 82, whilst in those unsuitably fed and narrowly penned, only 15 out of 60 survived nine weeks. These 45 deaths could not all be attributed to coccidiosis, for in two birds no coccidia were found; in all others, however, the coccidia were numerous and caused definite lesions of the cæca and bowels.

Further, different methods of treatment are being tried on the chicks with coccidiosis, but to obtain a favourable survival rate nothing appears as effective as the addition of skim milk to the mash and a generous diet. It must be made clear that these conditions are not recommended as positive cures—far from it; but they indicate how the spread of the infestation can be prevented and when present how the disease can be kept within definite boundaries.

These are by no means the only tests which have been made, but the main result of all those that have been carried out is to show that a diet deficient in vitamin A and low in proteids will result in a heavier mortality rate, if and when, coccidiosis is introduced in a stock of fowls.

COCCIDIOSIS AND VITAMIN D

In addition to the importance of vitamin A in relation to coccidial infestation, it had been frequently noticed, both on farms and in the course of experimental work, that fowls suffering from chronic coccidiosis were apt to develop crooked breastbones and thickened joints, which are the stigmata of rickets, and which it is known in many instances lead on to so-called leg weakness; these lesions developed notwithstanding the addition of cod-liver oil to the mash. When killed, the ovary was usually badly developed in pullets four to five months old and in some of the older birds numerous small inspissated yolks were found, so that at first suspicion arose that such fowls might be carriers of *Salmonella pullorum*, the cause of bacillary white diarrhœa. This was excluded; moreover, the lesions of the epiphyseal lesions, with their irregular calcification and distorted cartilage cell columns, were typical of avitaminosis D. Such alterations were noticed in pullets sent for routine examination, but a similar correlation between ricketty bones and coccidia, by sufficient cod-liver oil addition, has been confirmed on two batches of 50 sex-linked cockerels which accidentally contracted coccidiosis in the course of inoculation experiments; about half showed distorted keelbones.

Hence the conclusion may be allowed that, where coccidia are present, the quantity of cod-liver oil which otherwise would be sufficient to protect a chick from rickets, does not achieve its purpose. In later batches double the quantity was then given—2 instead of 1 per cent.—and it was then noticeable that the chicks resisted the attack of coccidiosis much more effectively. These experiments will be repeated, for alternative interpretations are possible. One may object that 1 per cent. cod-liver oil may not have been sufficient to protect all chicks; against this, the answer is that the oil was certified to contain 270 units per gramme of vitamin D; of this, 5 c.c. were measured into each pound of mash given the birds and intimately mixed by hand, and had previously been found effective.

Wire Netting and Coccidiosis.—Among the preventive measures recommended against coccidiosis are to be considered the provision of wire netting floors in brooders and continuation houses. Here I can refer to personal experience. In a lot of 100 chicks which were being reared for a control experiment, one four-week-old chick was observed with drooping wings, whilst blood-stained droppings were noticed in the tray. The chick was removed and killed and though blood was present in the cæca no coccidia could be at first detected, but schizonts were discovered by scraping the mucosa. A careful search revealed two more chicks with the ailment and, on these being killed, no further instances occurred. At the age of nine weeks the chicks were removed to a fold pen on an open field and here further symptoms of coccidiosis developed in three more pullets at the age of two months; here again, it was difficult to discover the source of the infestation.

The Natural Disinfection of Coccidia-Infected Appliances.—A chick wire and lath cage in which the coccidiosis outbreak occurred (to which reference was made in the *Veterinary Record* of April 23rd, 1932) was roughly scraped

and placed in the open, exposed to the weather for two years; thereupon 18 battery brooder chicks were placed in it without any further cleaning or disinfection; no coccidiosis developed in the 18 birds, though they were kept four weeks in the cage. This seems to show that though coccidia are no doubt extremely resistant under experimental conditions, yet their survival in practice is, possibly, not as evident, if a sufficient time factor is introduced. To complete the experiment it will be necessary to scrape the boarding and employ the scrapings in an infective experiment; this I trust to do later on.

The Chemical Disinfection of Appliances.—The removal of every trace of droppings or blood should be the first care; this is best done by means of a coarse scrubbing brush and a hot solution of one pound of washing soda in two gallons of boiling water. After this mechanical removal of every visible trace of infectious material the appliances can be exposed to the sun and air and eventually painted over with creosote.

Acquired Resistance to Coccidiosis.—Tyzzer, Theiler and Jones (1932), in their joint paper on coccidiosis, recommend as a preventive measure that chicks should be allowed to contract coccidiosis at an early age, so as to be resistant to a later super-infection. For this reason they appear to deprecate any attempt to rid any farm completely of coccidia.

It is not possible to agree wholeheartedly with such a suggestion, because, in the process of acquiring resistance to one particular coccidium, considerable harm is sure to result to the health and well-being of the fowls exposed to infestation; moreover, the intensity and spread of the coccidiosis cannot be controlled. This opinion is the outcome of experience with several medicines which have proved ineffective and also as the result of the consideration that it is easier to keep the possibility of coccidia infestation at a low level, than to root it out completely.

Therefore, if it can be confirmed that good feeding and the avoidance of re-infestation are decisive factors in the control of coccidiosis, then suitable methods are available to keep the disease well in check.

Preventive Treatment.—More particularly in relation to the avoidance of re-infection, the placing of the chicks on wire netting will keep infection down, though it is not an absolutely sure preventive measure.

The prevention of coccidiosis is a matter of plan or system, not of drugs. No treatment which cannot cure chicks or pullets so that the possibility of re-infection, if not totally excluded, is at least very greatly reduced, can be of any use; and no such treatment is yet known. Nevertheless, coccidiosis can be eradicated from farms or at least reduced to such mild proportions as to cause but very little mortality.

Individual Treatment.—The basis of this should be in the very first instance to get rid of all carriers of the coccidia and then to fortify the survivors by a generous diet; concurrently, the avoidance of re-infection should be kept well in mind and every effort made to place the birds on a reasonably extended range on a light, dry soil which can be easily raked.

Dealing with coccidiosis in large poultry farms is a difficult, expensive and extensive piece of work, yet considerable success can be achieved if the hygienic measures which have been suggested are consistently carried out.

In view of the importance of the subject a brief recapitulation of the suggestions made will not be superfluous:—

(1) Concentration of all energy on removing the carrier of coccidiosis by cutting out all birds which appear weak or bedraggled.

(2) Reinforcing the feed of the survivors by the addition of skim milk to the mash, every other day, alternated with 1 per cent. of certified cod-liver oil.

(3) Repeated disinfection of appliances; clean drinking water (no antiseptics or messes); placing birds either on wire netting or an extended dry range, as far away from other contaminated fowls as possible.

(4) Attention to the transport of soil, food or appliances from one place to the other.

(5) Not to use the same ground for healthy birds till it has been lightly forked over and allowed to lie fallow for six months at least.

In the relatively short time at our disposal, it has not been possible to do otherwise than select a few diseases as examples of the progress which has taken place in relation to the pathology of the ailments of the domesticated fowl; but it is understood that considerable advances have also been made in the prevention of other ailments, for example, bacillary white diarrhœa. One need only glance through any book on poultry diseases published ten or twelve years ago, to notice how much clearer are the conceptions regarding all that pertains to poultry husbandry and poultry hygiene, even if allowance is made for many problems which are still unsolved.

The choice of the subject of these lectures has been partly dictated by practical considerations, because it was evident that the ever increasing spread of certain morbid conditions of poultry deserved a more accurate explanation than the trite "lack of stamina" or the categorical imperative "back to nature." Incidentally, I have attempted to indicate that avian pathology fully deserves to be studied as a specialised branch of comparative pathology; not only because of its practical and economic value, but also in view of its intrinsic interest. More particularly I have striven to demonstrate the paramount importance of suitable and

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hygienic nutrition in relation to the manifold disease problems following in the train of the intensified breeding and enhanced egg-production which have taken place during these last ten or twelve years. I have not attempted to decide the dialectical question: "To maintain the health of poultry, which is more essential, breed or feed?" because I recognise that both are vital factors.

For the pathologist one may stress the advisability of recognising the fact that to diagnose the obvious microbic or parasitic cause of a disease is not enough; he should be in a position to study what one might call the ecology of each outbreak, by investigating on the spot and appraising the various circumstances which have intensified the multiplication and spread of the *causa morbi* and thus detect and recognise the correlation between strain predisposition, feeding deficiencies and errors in management. Anyone attempting to put such a programme in practice, may be countered by the objection that what is required is something to pour into the drinking water so as to make the birds healthy again. This demand will always be met by progressive commercial undertakings, whilst the study of the causation of disease, its treatment and prevention in all its aspects, are more fittingly pursued on the lines which have been described in these lectures and which have resulted in recent, and one trusts, lasting advances in the knowledge of poultry diseases.

FOWL-POX AND ITS DIFFERENTIAL DIAGNOSIS*

C. V. WATKINS, M.R.C.V.S., D.V.S.M.

I thank you for the honour of asking me to address this meeting. You will have read in a recent issue of the *Veterinary Record* an address by Mr. Dobson, a research officer of the Ministry of Agriculture, who dealt with the more common and important poultry diseases. I had intended to cover the same subjects, when your Secretary asked me to prepare a paper. Instead of doing this, I propose largely to remind you of what he said about fowl-pox, and then to discuss its differential diagnosis.

Fowl-pox is perhaps the commonest disease of adult fowls met with in this country. It is caused by a virus, which may give rise to three forms of the disease showing (*a*) comb lesions, (*b*) mouth lesions, (*c*) an oculo-nasal form. These variations have been the cause of much confusion in the past. They may occur singly in individual birds, or as a combination of any two or all three of them. Experiments have proved that all types of the disease can be produced by virus derived from all three situations.

*Paper presented to the Western Counties Division, at Truro, on June 21st, 1933.

The disease is not an infectious one, as direct contact with infective material appears necessary, and it is probable that wound infection actually occurs in the first instance, followed by a generalisation of the virus throughout the body.

A further set of lesions may occur on all parts of the skin of the body as the result of generalisation, particularly the head and neck, the fleshy part of the legs and points of the wings.

(*a*) *Comb Lesions.*—This form attacks all the featherless parts of the head, *i.e.*, comb, wattles, eyelids and adjacent skin. Lesions occur as warty growths varying in size from very small to upwards of a quarter-of-an-inch in diameter. They are at first yellowish, but tend to become a dark brown colour. Older lesions may be very irregular and have a tendency to coalesce. Their nature is essentially that of an epithelioma. This form is perhaps the least confusing to diagnose, and when not complicated by any other form, rarely greatly upsets the health of the bird, recovery commonly taking place in about a month. However, it is most important from the point of view of the whole flock. Firstly, as mentioned, it may cause other forms of the disease in any in-contacts; secondly, as long as disease is progressive virus is being manufactured; thirdly, a tendency to increased virulence of the virus when such a disease is not controlled, may lead to serious ultimate losses in the flock; fourthly, this more simple form may later manifest both the mouth and oculo-nasal forms of the disaease, when a very large proportion may die.

Mouth Lesions.—First symptoms may be merely dulness, loss of appetite, sneezing or a cough. These are later followed by lesions in the mouth, where diphtheritic membranes, firm, yellowish or greyish in colour, and adherent to underlying tissue, are found affecting all mouth parts and may be seen on the upper larynx and in the trachea. There is generally a progressive extension of any mouth lesions, so much so that with the increased area affected and thickening of the membranes, closing of mouth may be impossible. Death also often occurs as a result of complete occlusion of the upper larynx with a thick exudate of a cheesy nature. Fatal terminations may be due to absorption of toxic products, leading to emaciation and diarrhœa. These membranes are partly due to secondary bacterial invasion. The majority of birds thus affected usually die within three weeks of onset of symptoms.

Oculo-nasal Form.—The onset of symptoms is similar to that seen with mouth lesions, but in this form a watery nasal discharge supervenes. This thickens up into a pus-like material and tends to close the nasal openings. The eyelids become inflamed and swollen, and a sticky discharge may gum them together. The head may

have a swollen appearance, especially just below the eyes, which is due to an accumulation of the exudate in the infra-orbital sinus.

Birds Affected.—The common fowl principally, also pigeons and turkeys: much more rarely geese, guinea-fowl and ducks.

Incubation Period.—This varies from three to twelve days.

Mode of Infection.—Wound infection is probably the natural means of spread. The comb is liable to small injuries, and also the mouth, the latter from hard food and sharp grit. An inflammatory condition of the nasal passages may predispose to the oculo-nasal form, especially as disease most often occurs during the autumn and winter months.

Immunity.—All birds in a flock seem susceptible. Recovery from a severe attack leaves a strong immunity, and from a mild attack gives some protection. Any form of the disease with recovery protects to a greater or less extent against all other forms.

Mortality.—This is variable. The degree of infection present usually has a close association with hygiene and the weather. The potency of the virus is variable. If the disease is allowed to proceed quite uncontrolled the tendency is for an increase in the virulence of the virus.

Carrier Birds.—Most authorities agree that such do not exist, except as birds showing distinct lesions of the disease.

Treatment.—In the first stages of an outbreak, and when only a few birds are found affected, immediate slaughter of these should take place, followed by thorough disinfection. This entails frequent examination of all birds in contact with infected ones for the first signs of lesions, and such birds are best grouped in small lots. The birds, as examined, may be " ducked " in $CuSO_4$ solution, to limit any spread of infection through handling.

It is important to avoid mixing strange birds together, as this usually leads to fighting, and therefore wounds for infection. Change drinking water frequently. Feed grain and dry mash in troughs (do not use large dry mash hoppers). Attendants must disinfect boots and hands before leaving infected runs or houses.

Disinfection.—Spray out houses first, then clean up litter. Follow with 10 per cent. caustic soda in hot water and then a spray of 5 per cent. carbolic, 2 per cent. formaldehyde or 2 per cent. compound cresol solution. Disinfect runs with two tons quicklime per acre and leave for a couple of months before occupation again.

Preventative Treatment.—This is best practised by vaccination, using pigeon-pox virus. As you probably all know, this is prepared and sold by the Ministry of Agriculture Laboratory at Weybridge, the charge being a minimum one of 2s. 6d., and at the rate of 1d. per dose. They recommend its use within one month of receipt and, from their experimental findings, claim that protection against natural infection may be expected for about one year. Two precautions must be observed. First examine all birds before vaccination, as it may actually be harmful if they are already visibly affected (and of very doubtful benefit if they are in the incubative stages of the disease). The other precaution is to avoid infection of vaccinated birds as far as possible for at least three weeks, whilst the immunity is being developed.

Other precautions to take apply to most diseases. New stock should be isolated for one month. If any unthriftiness is noticed in such birds, or any disease lesions, introduction to the flock should be delayed until the cause is ascertained. Excellent results from vaccine treatment have been obtained, but there is plenty of further scope for its use in this country. (In Connecticut, U.S.A., 416,000 birds were vaccinated in 1929.)

Differential Diagnosis

(1) Favus.

This may be confused with the comb lesion type of fowl-pox. It is caused by a fungus, which incidentally is transmissible to man (*Achorion gallinæ*).

Affected areas are generally found on the unfeathered parts of the head, the lesions being white in colour—hence the name " white comb." Small lesions tend to coalesce and the crusts get thicker, taking on an appearance likened to mica scales.

The condition may persist for months, but is rarely fatal. Affected birds should be isolated and treated. For the treatment of this ailment, iodine preparations are good. French authorities recommend soft soap and lard.

(2) Simple Cold, Catarrh of Nasal Passages, or Chill.

This is a very common condition which affects all species of domesticated fowls. It is due to various bacteria, *plus* the predisposing cause—a chill, bad housing, draughts, dampness, lack of sufficient food or unsound food, etc. An inflammation of the nasal passages is set up, and a watery discharge commences at the nostrils and perhaps from the eyes.

Symptoms.—There is usually dulness. Appetite is variable. Breathing becomes difficult, and this usually coincides with a watery discharge from one or both nostrils. The discharge either ceases and recovery occurs in about four days, or the disease may be more progressive, leading eventually to a sticky discharge with a tendency to plug up the nostrils. This, in turn, leads to mouth breathing, and any further discharge may then drop from the cleft in the palate on to the ground, or be swallowed. The only lesions in an uncomplicated case are found in the nasal passages, the membranes of which are swollen and congested.

Treatment.—Attention to hygiene is of first importance, affected birds requiring better conditions as regards food and housing, etc. Mild antiseptic lotions, such as a weak boracic or a bicarbonate of soda solution, etc., may be used to syringe out the nostrils, the bird being held with the head downwards; but such treatment is only called for in the more severe prolonged cases, and when valuable birds are concerned.

The importance of the condition lies in the fact that during the initial period of an outbreak symptoms shown are indistinguishable from those of contagious roup and also the oculo-nasal form of fowl-pox. Therefore isolation precautions are then called for until the condition is diagnosed.

(3) Contagious Catarrh or Roup.

This is a fairly common infectious disease of poultry and caused by a virus, generally occurring in the autumn and following bad weather. Symptoms shown are largely those of the oculo-nasal form of fowl-pox. In addition, roup may be the cause of the formation of diphtheritic membranes in the mouth.

Inoculation experiments have served to distinguish the viruses of the two diseases in that the virus of roup is incapable of setting up any external skin lesion, except an excoriation around the eyelids, etc., due to a discharge there.

Two forms of the disease are recognised: acute and chronic. In the former, with the onset of a watery discharge from nostrils and eyes, sneezing may occur and the eyes become inflamed. Mouth breathing is common, through partial plugging up of the nostrils. Breathing becomes more laboured, and signs of unthriftiness appear. Birds may now refuse all food and generally draw apart from the remainder of the flock, seeking a dark corner to themselves. Rapid emaciation now sets in, followed by death in a few days.

Instead of this rapid emaciation, with death, the chronic form of the disease may supervene. A bird affected with the chronic form of this disease looks a " waster." It is usually light in weight, with pale comb and wattles and certainly not in laying condition. Characteristically it is found self-isolated from the flock, and it occasionally sneezes. If examined, the only symptoms shown may be a slight nostril discharge of a greyish, gummy nature, more readily detected if the nostril is pressed. Such a bird should be immediately destroyed.

Precautions.—Prompt isolation may check an outbreak, and if only a few are affected, destruction of these is advisable.

Hygienic precautions, regarding housing and sanitation, are essential, and include attention to draughts, dampness, and lack of correct ventilation particularly. The virus is resistant, and 5 per cent. coal tar disinfectants are recommended to be used daily during control measures. Burn all carcasses.

As the disease is a fairly common one, all newly-purchased birds, or those returning from shows, should be isolated for at least two weeks. If it is known to exist in a neighbourhood the disease should be constantly looked for.

(4) Nutritional Roup or Avitaminosis A.

This is a disease of poultry caused by a lack of vitamins in the ration. It is mentioned because some of the lesions greatly resemble those of other diseases already mentioned.

Affected birds are generally in poor condition. The characteristic lesions are found in the mouth, throat and gullet, and the eyes show marked changes. In the mouth, thin, white, false membranes, only loosely adherent to the underlying tissues, may form, and, especially in the pharynx, small, whitish, characteristic pustules. With these lesions a slight nasal discharge may occur. The eyes discharge a thick viscid material, which tends to dry up, forming a thin, whitish film over the nictitating membrane, which thus becomes more prominent. A white, cheesy material tends to collect in the conjunctival sac, and the infra-orbital sinus may bulge outwards through collection of a similar inspissated discharge there.

The disease is frequently complicated by visceral gout. Pullets appear more liable to the disease than adult fowls. Diagnosis is aided by an examination of diet of affected birds and their hygiene. The disease is incapable of being spread by experimental inoculation.

Treatment consists of good hygiene, including sunlight. Sprouting cereals, such as oats, *plus* green food, will supply the necessary vitamin A; also cod-liver oil of good quality in the proportion of one quart to every 100-lbs. of mash. A sunburnt grass run is of itself almost useless.

(5) Canker.

This term should be applied to mouth and eye lesions in which false membranes occur as a result of other causes than those of fowl-pox, roup or avitaminosis A.

It may be set up by sharp foreign bodies which cause wounds, these latter being invaded by bacteria. Such foreign bodies may often be found deeply situated in the caseous material. Cases are rarely numerous in a flock, and the term mechanical canker has been applied to them.

Two other forms have been described:—

(*a*) *Malignant Canker.*—This is a very fatal form and, apart from the bacillus of necrosis, no cause has been found for the condition. The condition has received much attention in the United States and, according to one authority there, all his cases were fatal ones.

Thick membranes form in the mouth, which are very adherent and penetrative into underlying tissues. They rapidly re-form after

removal. Birds are markedly depressed, there is loss of appetite and great emaciation.

(*b*) *Benign Canker.*—This is similar to the above-described malignant canker, but its course is mild, the birds do not appear greatly inconvenienced by it and there is never a fatal termination. No cause for the condition has been found.

No type of canker ever appears contagious.

(6) Avian Laryngo-tracheitis.

This is a very infectious disease of fowls, caused by a virus, the chief lesion being an inflammation of the larynx and trachea. The disease has been described in the U.S.A., and usually runs a very rapid course, causing severe losses. It has occasionally been found in association with fowl cholera. The disease attacks principally the common fowl and also pheasants (these were the only birds attacked in an outbreak reported in the States in a large bird fancier's cages in which most birds were present). The more common lesions found on *post-mortem* examination include: (1) shedding of the superficial layers of epithelium in the trachea; (2) the formation of false membranes in the respiratory tracts; (3) congestion with occasionally a fatty degeneration of the liver; (4) inflammation of the spleen, and (5) hæmorrhages in the kidneys. The lungs may sometimes be consolidated and often contain a sanious discharge in the air passages.

The virus is infective for birds of all ages and both sexes. As in most virus diseases, complications in the lesions almost invariably result from the later action of bacteria.

There is no connection between this disease and fowl pox, as far as can be ascertained experimentally.

Symptoms.—Ruffled feathers, watering of eyes, elevated temperature: there may be inappetence and sometimes vomiting. Comb and wattles may be dark purple in colour. False membranes may be detected during life in the larynx, and breathing becomes difficult. Swellings may occur under the eyes, and death is due either to suffocation, toxæmia or general debility. So far, no treatment has been successful, and strict hygienic precautions are the only recommendations for the disease, should it make its appearance in this country. It may be introduced by such gatherings as the World's Poultry Congress (at the 1930 Congress it was at least suspected in one case among the American exhibits).

Discussion

Mr. R. B. Nelder asked if vent gleet was transmitted by the male bird.

Mr. H. W. Townson enquired as to the method of vaccination against fowl-pox.

Mr. Richardson asked what was the nature of the vaccine and where it could be obtained.

Mr. R. H. Smythe referred to the disinfection of poultry houses, and said that when walls were treated with lime to which 5 per cent. carbolic acid had been added, he had noticed that birds resting against the walls had died, apparently as the result of the absorption of the acid.

Mr. J. M. Penhale requested to be informed if vaccinated birds could infect other birds, and if so, for how long they should be isolated. He also asked if smell was of any value as an aid to diagnosis.

Mr. Forbes made some enquiries as to gapes.

In reply to the queries, Mr. Watkins said that vent gleet was transmitted by the male bird.

Vaccination against fowl-pox was carried out on the fore part of the limb, just above the hock, over the fleshy part of the leg. A few feathers were removed, about eight follicles were scarified, and the vaccine was then rubbed in with a cotton wool plug.

In reply to Mr. Richardson, the essayist said that anti-diphtheritic vaccines were either killed virus, or attenuated living virus. Passage through pigeons reduced its virulence. Vaccine was obtainable from the Ministry of Agriculture, and was of the latter variety. With regard to the disinfection of poultry houses, Mr. Watkins remarked that the blow lamp was very useful, as other methods might miss parasites which would later come out and be possible vectors of disease.

In answer to Mr. Penhale, he said there was a danger of infection until the lesions had healed, but the question did not often arise as the whole flock was usually vaccinated. Smell was of service in diagnosis, but might lead to confusion with roup. In reply to Mr. Forbes, Mr. Watkins mentioned the treatment of gapes with a feather moistened by turpentine. He said there was an age immunity, and birds over nine weeks old were unlikely to pick up infection, although parasites might be harboured from chick age.

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A farmer was fined £4, including costs, at Banbury, for moving a cow to Banbury Midland Marts Saleyard in an unfit state. The evidence showed that the animal arrived at the market in a dying condition, and the veterinary inspector at once ordered it to be shot. The *post-mortem* revealed advanced tuberculosis.

The Veterinary Record

September 30th, 1933.

LLANDUDNO—1933

THERE is always that feeling of regret when the Annual Congress of the National Veterinary Medical Association comes to an end, as apart from the quality and professional importance of the papers presented for discussion, there is that indefinable attraction of friendships renewed, and social events continued in localities which are specially selected to foster enjoyment of the same. There can be no question that Llandudno lent itself to all those amenities, and it was a happy choice on the part of the Association, not only to honour Wales for the Congress of 1933, but to fix on so charming a health resort, well equipped with hotel and other accommodation at reasonable charges. The best thanks of the Association are certainly due to the Urban District Council for having placed the Town Hall at the disposal of the Council and members for all purposes of the Congress, including the Exhibition of Drugs and Instruments by various firms.

The Provisional Committee, too, is to be congratulated on the excellence of the arrangements made. The grouping of the subjects for papers under the various headings of Public Health, Veterinary Medicine and Surgery, Experimental Pathology and Combined Sections, greatly facilitates discussion and conclusions when it becomes necessary to formulate resolutions for the consideration of public bodies and Governmental action. The papers presented were well chosen from the practical point of view, the writers and openers of the discussions being experienced in the relative aspects of the points at issue, and discussion was well sustained. When the full record comes to be printed and placed before the profession, some useful outcome of veterinary scientific endeavour will be disclosed. It is perhaps invidious to suggest individual papers as of greater importance or merit than others. The value of a Veterinary Congress lies in a survey of all aspects of Veterinary Science, and the best practical means of combating animal disease, both as to prevention and cure. It may therefore be taken for granted that the Congress at Llandudno has not failed in this respect. Whether or not the Congress was sufficiently attended by members of the N.V.M.A. is another matter. True it is that many members reside abroad, or in other respects are too far distant to attend the usual Annual Congress, and others by reason of already having taken their annual holiday; nevertheless, the numbers attending the discussions on the various papers would appear to indicate the desirability of a greater attendance at Congresses generally. In this connection the proposal to hold the next Congress earlier than in September is a wise move.

The social sides of the Congress, *viz.*, the Reception given by the President, the Annual Banquet, and the Dance in aid of the Veterinary Benevolent Funds were well attended, and added greatly to the pleasures of the occasion. A very enjoyable afternoon was spent on Tuesday at the University College of North Wales, Bangor, and the Ladies' Tour of Snowdonia on the Wednesday was distinctly a success. Those who were golf inclined were afforded every opportunity at the Llandudno Golf Links (Mæsdu) of displaying their prowess in competing for the trophies presented.

Edinburgh having been selected as the venue for the Congress of 1934, it is to be hoped that as many members of the National Veterinary Medical Association as possible will repair to that beautiful city, and enjoy the delights of "Bonnie Scotland."

NEW ZEALAND'S LIVESTOCK EMBARGO

"Lord Bledisloe, the Governor-General of New Zealand, has on several occasions directed the attention of New Zealand farmers to the handicap they suffer from the embargo enforced in the importation of pedigree stock direct from the United Kingdom," says the Agricultural Correspondent of *The Times*. "A small concession has now been made by a reduction from six to three months in the period during which stock from Britain must be kept in Canada, the United States, or Australia before shipment to New Zealand, but the procedure involves great expense and the position is still far from satisfactory. When Mr. Coates was in this country for the World Economic Conference he met representatives of the pedigree stock breeding industry, and it is hoped that the whole question of direct shipment will be reviewed on his return to New Zealand.

"The Association of Veterinary Officers of New Zealand recently passed unanimously a resolution advocating the admission of British pedigree stock in view of the efficiency of the London quarantine station and the complete safeguards afforded against the possible introduction of foot-and-mouth disease into the Dominion. But the New Zealand Farmers' Union have again urged the Government on no account to remove or modify the existing continuous embargo on the direct importation of pedigree stock from the United Kingdom. The dread of foot-and-mouth disease is understandable, but the farmers of New Zealand must not imagine that this country is in the same category as the continental countries where the disease is almost endemic. The United Kingdom is kept free from foot-and-mouth disease at all costs."

Clinical Communications

LAMENESS AFFECTING A YOUNG HUNTER

A. R. SMYTHE, F.R.C.V.S., D.V.S.M.
Falmouth.

When I was on a farm one day a young hunter, about four years of age, was brought out for inspection, and it was obvious that he had a small ringbone on his off-fore leg.

Three months or so later the same horse was sold and put to work, and on being slowly ridden home after a day's hunting he suddenly went dead lame on the off-fore leg,

When visited he was carrying the leg, and there was well-marked heat and pain from the middle of the large metacarpal bone, reaching down to the hoof.

The condition was very suggestive of split pastern, but no crepitus could be detected. The leg was placed in a plaster charge, and later blistered, and after about two months the horse could walk with a barely perceptible limp. Improvement was maintained, and the enlargement became gradually smaller, but never completely dispersed.

The owner commenced to recondition the animal, when the leg suddenly swelled up again, the horse showing very marked lameness.

After a fortnight, numerous small abscesses formed up and down the affected part of the leg, breaking and discharging a little pus, and, on probing, roughened particles of bone could be felt. The animal was destroyed, and the affected bones preserved.

No evidence of split pastern could be found. The principal lesions were a marked periostitis and ostitis, involving the distal end of the large metacarpal and the proximal end of the os suffraginis, accompanied by the deposition of new bony deposits, with a very roughened and irregular surface.

The remarkable feature in this case was the sudden onset of the lameness and the unusual suppuration which accompanied the condition.

* * * * *

TETANY IN A MARE

A. R. SMYTHE, F.R.C.V.S., D.V.S.M.
Falmouth.

The owner rang up one evening stating that he had a mare suffering from tetanus. Upon arrival, it was ascertained that the mare had foaled some weeks previously, and that the foal was partially weaned. On the evening in question, the owner had driven the mare on a short journey, and on the way home she began to ramble, so that she was got back to the stable only with difficulty.

Upon examination, she showed the following symptoms: dilated nostrils, well-marked puckering and contraction of the region around the upper lip (more suggestive of strychnine poisoning than of tetanus), localised patchy sweating, muscular fibrillation over various parts of the body, inability to stand steadily on the hind limbs and, in fact, general swaying of the body from side to side, which rapidly became more pronounced, so that the mare looked like falling in her stall. The tail was elevated, showing well-marked quivering, and flatus was repeatedly passed at short intervals. The protrusion of the nictitans over the eye, as seen in tetanus, was absent.

The quarters of the mammary gland were inflated, and improvement was almost immediate; in ten minutes the mare stood quite steadily. The following morning she appeared quite normal, and was turned out to pasture.

* * * * *

RANULA IN A COW

F. C. HEATHCOTE, M.R.C.V.S.
Bridgnorth, Salop.

A few months ago I was asked to examine a milch Shorthorn cow which was reported to be losing condition rapidly.

Symptoms.—These were at first alarming: the clinical picture aroused my suspicions of foot-and-mouth disease. The cow was emaciated, hide bound, stiff and lame in gait, and ropy saliva poured from her mouth; there was also some champing of the lips. The owner said she had been in this condition some two weeks and he thought it was a case of tuberculosis.

On examination of the mouth, a cyst-like swelling, about the size of a lemon, was discovered attached to the lateral surface of the tongue and lower jaw; there were no lesions on the dental pad or elsewhere in the mouth or outside it, and no foot lesions.

Diagnosis.—Ranula.

I operated, swabbed with iodine and left Lugol's solution to be applied to the raw surface of the wound daily. Potassium iodide was also administered for four days. The improvement was spectacular and after two weeks she made a full recovery. Her condition to-day is splendid.

* * * * *

CASEOUS LYMPHADENITIS: RESULTS OF SIX YEARS' OBSERVATIONS

A. H. HUNTER, M.R.C.V.S., D.V.Sc., D.V.S.M.
Chile

Referring to the work of Descazeaux (*Bull. Acad. Vét. France*, Vol. ii, July, 1929) in Chile, and the Australian workers (*Jour. Sci. & Ind. Research*, Vol. 3, No. 3, August, 1930), the following observations were made in the different freezers along the Straits of Magellan in

Southern Patagonia. These observations extended from 1928 to 1933 on animals sent to the freezer for slaughter.

The lambs are not shorn and are received when they are about six months old—maiden ewes and hoggets at 18 to 20 months, wethers and ewes from at least 30 to 32 months and the rams at four to five years.

Cases	Number Observed	Average Percentage
Lambs	2,778,755 ...	0·578
M. Ewes	100,980 ...	2·16
Hoggets	90,260 ...	6·04
Wethers	281,957 ...	13·61
Ewes	493,833 ...	26·86
Rams	3,642 ...	20·73

Where hoggets were slaughtered mixed with wethers the data are omitted. The ranges shown above are for the different freezers, and individual farms show greater variations.

Farm.	Lambs.	Maiden Ewes.	Hoggets.	Wethers.	Ewes.	Rams.	Total Slaughtered,
	%	%	%	%	%	%	
A	0·77 ...	6·75 ...	6·89 ...	24·02 ...	44·00 ...	20·00 ...	21,233
B	0·83 ...	6·01 ...	6·89 ...	19·40 ...	37·02 ...	— ...	29,121
C	0·35 ...	1·10 ...	2·24 ...	11·55 ...	— ...	23·00 ...	24,064
D	0·20 ...	2·48 ...	7·44 ...	9·32 ...	40·00 ...	— ...	38,834
E	0·28 ...	0·00 ...	0·23 ...	0·61 ...	— ...	— ...	15,802
F	1·77 ...	4·30 ...	4·78 ...	8·52 ...	— ...	— ...	13,490
G	1·94 ...	3·02 ...	3·48 ...	7·66 ...	— ...	— ...	12,043

— No data available.

The first four farms border on the Straits of Magellan on the continental side; the others are on Tierra del Fuego. Farm E has several salty lagoons. The data for these seven farms were obtained during the 1933 season.

Climatic conditions, pasture variations or differences in breeds have no influence on the above.

On the first four farms, A, B, C, D, extra pains have been taken at marking time by using Burdizzo emasculators, and although this has slightly diminished the percentage of lambs affected over the last five years it has had no influence on the older animals. None of these farms had paid much attention to hygiene of the shearing sheds and the precentages of older animals affected with caseous lesions are increasing slightly from year to year.

More attention should be paid to the disinfection of machine heads used for shearing, and accidental wounds occurring during this time.

Shearing takes place in the usual type of colonial shed, while the castration, marking, etc., are carried out in marking pens in the middle of fields far away from the settlements, and from year to year the infected dust must surely be removed by the strong winds that blow or the organisms destroyed by the intense sunlight during the summer months.

Abstracts

[Caseous Lymphadenitis in Sheep. Foutela, J. M. *La. Res.* Buenos Aires, 7, 33.]

This is a specific disease of sheep, produced by the bacillus of Priez-Nocard—whose ravages are most perceptible when the condition has become chronic. It is practically unnoticed in young animals.

Synonyms.—Cheesy disease, cheesy abscess, pseudo-tuberculosis of Priez-Nocard, lymphadenitis, ulcerous lymphangitis.

The Abscesses.—The presence of abscesses first calls attention, " tumours of pus " of large size which can be easily felt or seen. They are mostly found in the regions of the lymphatic glands, superficial or deep; most frequently in front of the shoulder and the insides of the thighs.

General State of the Infected Animals.—There may be noticed small superficial swellings, which do not seem to affect the general health. But when the swellings develop in the deeper-seated glands they produce serious changes in the respiratory system, cough, etc., followed by debility and a very rapid loss of flesh.

Contents of the Abscesses.—When a swelling is opened it is found to consist of a greenish-yellow pus, which contains the actual causal organism. Sometimes the deeper-seated abscesses rupture into one of the body cavities, with grave results.

How Infection is Produced.—The umbilicus is considered the principal gate of infection, but it may enter by any other wound. This latter is less frequent, owing to the protection given by the wool. Finally, it may follow castration or docking.

Contaminated Pastures.—Animals with small superficial open abscesses contaminate the pastures.

Combating the Disease.—By separating out those sheep which have palpable or visible swellings, particularly when such are suppurating. If the flock is free from disease care should be taken to disinfect the umbilical cord at birth; also to be very punctilious in disinfecting all wounds resulting from shearing, tail cutting and castration.

Caseous lymphadenitis in sheep is not contagious to man, but the presence of the disfiguring abscesses in the carcass is the reason why many countries in Europe will not permit it in their markets.

W. J. M.

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[The Domestic Fowl of Uganda as a Host for Trypanosomes of the *BRUCEI* Group. Duke, H. L. (1933). *Parasitology*, 25, 2. April 1933, pp. 171-190.]

The writer recalls that it has been known for many years that the domestic fowl, together with some other species of birds, is susceptible to experimental infection by trypanosomes of the *Brucei* group. He points out, however, that the experiments were performed in European laboratories under unnatural conditions, and that a natural infection of birds with these trypanosomes has never yet been reported.

He therefore carried out certain experiments to ascertain whether the Uganda fowl *in the experimental conditions obtaining at Entebbe* could become infected with *T. rhodesiense* or *T. brucei* by being bitten by tsetse cyclically infected with these trypanosomes; and, if so infected, whether the fowl can in its turn infect clean *Glossina palpalis*. As a result of the investigations recorded he found that the domestic fowl of Uganda is susceptible to infection with *T. rhodesiense* and with *T. brucei* by the bite of *Glossina palpalis* or *G. morsitans*, and that a fowl so infected with *T. rhodesiense* can infect clean *G. palpalis* fed upon it, but apparently only with very great difficulty. There is, however, evidence to show that the fowl is only infective to fly in the early stage of its infection, and even then only very slightly. From the experiments described in this paper it appears very unlikely that the fowl need be regarded as a factor in the spread of human trypanosomiasis in nature, at all events in *G. palpalis* regions. To those engaged in the control of trypanosomiasis this is an observation of considerable importance.

Ll. E. W. B.

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[Some Observations on the Methylene Blue Reductase Test. Miles, C. S. *Journ. Min. of Agric.*, xl, 5, Aug., 1933.]

The test is used considerably as a method of examination of milk samples where bonus payments are made for milk of low bacterial count.

Compared with other tests it is cheap and can be rapidly carried out. As a method of grading milk, its value in its present form is open to question. The author (at Bristol University) tested during 18 months 398 milk samples in duplicate by the Reductase Test, the Standard Plate Count, the Coliform Test and the Keeping Quality Test. The Reductase Test was originated by Barthel and Orla-Jensen (1912) and depends upon the fact that bacteria are able to reduce certain dyes to a colourless form. Theoretically, the greater the number of bacteria present the more rapidly will this reduction take place.

Hiscox and Starling (1925) pointed out that no claim is made for the Reductase Test as an exact method for estimating the number of bacteria in milk, but that it is claimed that milk which takes five-and-a-half hours or more, reduction time, contains 500,000 bacteria per c.c. or less.

Of the author's 398 samples 292 had a reduction time of five-and-a-half hours or more, but seven of these 292 samples had a bacterial count in excess of 500,000 per c.c. Conversely, of the 106 samples with a reduction time of less than five-and-a-half hours, 36 had bacterial counts of less than 500,000 per c.c.

It is evident that the Reductase Test cannot be accepted as a reliable and fair method for the classification of milk.

From the trade point of view, the main object in the bacteriological examination of milk is to obtain a measure of its keeping quality and general commercial utility.

It would seem, from a comparison of the tests made, that there is better correlation between the plate count and the keeping quality than between the reduction time and the keeping quality of the sample.

The author's conclusion is that the Reductase Test is unsuitable as a method of examination of milk of low bacterial count and does not constitute a fair means of determining the bonus payments to be made for such milk.

W. L. L.

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[Observations on Infectious Calf Pneumonia. Schmid, G. *Schweiz. Archiv. f. Tierhlk.* (1933.) Vol. 75, No. 4.]

The author describes an outbreak of calf pneumonia with a high mortality on a farm free from contagious abortion. The causal organism was finally elucidated as *B. pyogenes* and an appropriate vaccine gave good results in prophylactic treatment of calves born later. The outbreak was arrested after the apparent source of dissemination of infection—a drinking trough—had been suitably dealt with.

J. E.

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[Shortage of Veterinary Surgeons in Buenos Aires. [Edit.] *La Res.* Buenos Aires, 7, 33.]

It is very difficult for the inhabitants of towns of less than 3,000 inhabitants to be sure that the meat they purchase is wholesome. The scarcity of veterinary surgeons is evident. If they have been appointed nobody has the least idea of their existence, unless one should arrive with the object of looking over a farm for sale. Sometimes the police intervene and order a

carcass to be buried. We all know in some towns, the bad water and the close proximity to slaughterhouses of manure heaps, w.c.'s and other injurious deposits. There is not even practised the most elementary hygiene and the carcasses get splashed with mud and blood. We must insist on the appointment of veterinary surgeons to overcome this state of affairs.

W. J. M.

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[**The Genuine Pure Arab Breed of Horses.** Ramelet, Col. A. R. *Schweiz. Archiv. f. Tierhlk,* 1933, Vol. 75, No. 5 (orig. in French).]

The author, who is clearly an expert on horse breeding, here gives a detailed account of the origin of the Arab horse and traces its history down to the present time.

The Pure Arab breed has had an unbroken descent for more than 2,000 years: it is the Nedj race bred by the Anezeh tribe, which is nomadic. The five branches of the Arab breed, collectively named the Khamseh, are the Koheilet, Abeyan, Habdan, Saglaoui and Hamdani. The Khamseh pedigree is kept in manuscript form. The author gives details of the chief families and indicates the origin of famous stallions imported into European countries—the Godolphin Arabian, Darley Arabian, etc.

He also tells where the present indigenous stock is to be found in Arabia, Syria, etc., and shows how the genuine Arab horses can be distinguished.

J. E.

Review

[**Pocket Handbook of Meat Inspection.** By Gerald Leighton, m.d. Second edition. pp. viii + 137. Edinburgh and London: Hodge and Co. 1933. Price 6s.]

It is obvious that this small brochure serves a useful purpose. The first edition has been out of print for some time and a second edition has been placed on the market in response to repeated appeals from various sources. The handbook is intended to be a guide to the Public Health (Meat) Regulations (Scotland) 1932. These regulations, originally promulgated in 1923, have been amended from time to time. In the second edition the handbook has been revised and brought up to date. A new chapter has been added which is intended to help inspectors in the preparation of official reports of abattoirs, and suggested forms of records for use in public and private slaughterhouses appear in an appendix.

The regulations are set out in detail with clearly expressed explanatory notes which will be found most helpful by students preparing for examination in meat inspection. Officials charged with the duty of applying the regulations will find the book handy and useful for reference and worthy of a place on the office desk.

In view of the close similarity between the recommendations of the Ministry of Health in relation to the inspection of meat, as set out in Memo. 62 (Foods), and the Public Health (Meat) Regulations (Scotland), the handbook may prove helpful to meat inspectors on the English side of the Border.

The work of the publishers is all that could be desired.

Report

FEDERATED MALAY STATES AND STRAITS SETTLEMENTS

VETERINARY REPORTS FOR 1932

Both these reports show the drastic measures adopted for retrenchment. It is hoped that this depletion of staff is a purely temporary measure and that the Departments will be restored to "pre-slump" strength when occasion permits. Efficiency cannot be maintained in some of the States thus depleted, even with no serious outbreaks of disease on hand. Fortunately, the year under review has been free from serious outbreaks.

In comparison with other Colonies, one is struck by the absence of organised research work. In view of the P.V.O.'s remark that this was due to lack of facilities, it is hoped that the Government will seriously consider this matter. The P.V.O.'s remarks on poultry and equine disease outbreaks alone (experiments in the latter having been carried out by owners!) should emphasise this. Apparently there is no research department. Other Colonies find such a department indispensable.

Rabies appears intractable. The proposed application of protective inoculation (compulsory?) if feasible, should do much to mitigate the present difficulties.

In view of the importance of the buffalo to Malayan agriculture, it is satisfactory to note the steps taken to improve the breed. Doubtless native owners will take advantage of the facilities offered—these facilities could usefully be extended to cattle and pigs.

That amalagamation of the Department with the Agricultural is not contemplated is a matter for congratulation. It is very essential that, for the highest efficiency, the Veterinary Department should be autonomous.

H. S.

N.V.M.A. Divisional Reports

WESTERN COUNTIES V.M.A.*

PRESIDENT'S ADDRESS AT TRURO

The Summer Meeting of the Western Counties Division of the N.V.M.A. was held at the Royal Hotel, Truro, on Wednesday, June 21st, at 2.15 p.m.

The President, Mr. R. Barons Nelder, occupied the chair, and the following members signed the attendance book: Messrs. R. B. Nelder, Masson, Richardson, R. H. Smythe, F. T. Harvey, C. V. Watkins, J. Forbes, H. W. Townson, C. Crowhurst, J. M. Penhale, A. S. Head, A. R. Smythe, and S. J. Motton.

Apologies for absence were received from Sir John M'Fadyean, Sir Frederick Hobday, Majors Dunkin, Wright, Ascott, and James, and from Messrs. R. H. Penhale, E. R. Edwards, E. J. Thorburn, H. C. Wilkins, Irvine, Norman, Bloye, W. B. Nelder, Roberts (Uffculme), Kauntze, Stephens, and G. Harvey.

The minutes of the previous meeting, having been published in the *Veterinary Record*, were taken as read, after a correction had been made. The name of Mr. E. R. Edwards had been omitted (through a secretarial error) from the list of those elected as the Council of the Division.

Correspondence.—A letter from the N.V.M.A. dated April 11th, was discussed. The members had received a memo. concerning this, prior to the meeting.

New Members.—Mr. Peter Baird, of Dulverton, and Mr. H. Macdonald, of Axminster, were unanimously elected members of the Division.

Presidential Address

The President (Mr. R. B. Nelder) gave his Presidential Address, in the following terms:—

It is usual for a newly-elected President to give an address on taking the chair for the first time. It is not my wish to depart from what is customary, or to shirk the duty, but as we have rather a full programme and an interesting paper as well, I do not propose to address you at great length. There are a few matters, however, that I wish to speak about.

I must first of all thank you for the honour that you have conferred on me by electing me your forty-seventh President, but when I look back at the list of illustrious members who have occupied the chair of this Association, I fully realise how difficult a position I find myself in at the present moment. With the help of our worthy Secretary, and your kind indulgence and co-operation, I hope, however, that I shall be able to continue the good work carried on by my predecessors.

You can, of course, greatly help by turning up in good numbers at the meetings—not that you have not done so in the past, for I think the attendances at our meetings on the whole are very satisfactory when one considers the wide and scattered area that we cover. It is worth making a great effort to come, for I, for one, never attend without greatly benefiting, not only by listening to the papers presented, but by little tips and ideas picked up in course of conversation with one another. If it were for the friendly chat alone, it would be worth the time spent away from one's own little shell.

Progress.—I think everyone will agree that our profession has made tremendous strides during the last 20 years. This progress is not appreciated as it should be by the general public, who benefit by our increased knowledge. Perhaps it is partly our own fault, for Englishmen are not good at blowing their own trumpet. No doubt, this may be remedied in the near future, as far as the West Country is concerned, for we are gradually getting a large "Northern" element, and if tradition again holds good, they are not so shy as we are.

Several new research laboratories have been established in recent years at Cambridge, Camden Town, and elsewhere. This is all to the good, for they are each and severally working on problems that have puzzled the general practitioner for a long time, and it is to be hoped that their labours will eventually solve them and be of benefit to stock owners as well as to ourselves. We already have one instance of this being the case, the preventive inoculation against distemper being evolved after several years patient work at Mill Hill, and in course of time, as the material becomes cheaper, no doubt every puppy will be vaccinated as a matter of course, and so bring to an end one of the worst bugbears of dog breeding.

Advance in general practice has also been very marked. Many new methods of treatment have quite revolutionised the older ideas, but it is quite unnecessary for me to go into details in this respect. Then again, the character of practice has so altered. Thirty years ago, I suppose, it was quite exceptional for a veterinary surgeon to be asked to look at anything except one of the larger domesticated animals. Then canine and feline patients came to receive attention, but nowadays, the scope is much wider. One is required to treat such creatures as marmosets, monkeys, mongoose, guinea-pigs, rabbits, ferrets, cockatoos, canaries, and, of course, all classes of poultry. We should, I think, lay ourselves open to this class of work; country practice is gradually slipping away and anything that can take its place should be welcomed with open arms. Moreover, the work is not nearly so arduous and the compensation much greater in proportion.

* Received for publication, August 19th.

Perhaps I should not close this paragraph without referring to the rebuilding of the London Veterinary College, which is now going on quite actively. When all the work is completed, it will make a tremendous difference to the conditions under which all have laboured there for many years. My memory is still very fresh as to how we carried on when I was there, and already I begin to envy students of five or six years hence.

National Veterinary Medical Association.—I now wish to refer very briefly to our parent body, the N.V.M.A. It is so well known to us that perhaps we are at times unmindful of the tremendous work that it performs for our welfare. It must be obvious to everybody how the "National" is going from strength to strength, but especially so to those who are intimately connected with it. The office of President is no sinecure; in fact, it is practically a whole-time job, and the present holder, Colonel P. J. Simpson, is serving his third period, so the debt we owe to him is now very great.

The N.V.M.A. at the present moment is particularly favoured in the choice of its officers, both honorary and otherwise, and I think the height to which it has grown is entirely due to the excellent team work in evidence.

When I was elected a member of the Council nine years ago, we used to get through the meetings of the Committees and the Council all in one day; now, we find it often difficult to complete the agenda in two days. I merely mention this as an illustration of how enormously the work has increased in a few years. This happens, you must remember, every three months, and, in addition, the Finance Committee meets every month, and the Editorial Committee, as you know, every week. The time and energy the members of this Committee expend for our benefit in turning out the *Veterinary Record* is colossal, and recently they have taken over, as well, a considerable amount of work in connection with the Annual Congress, such as the compiling of the Association Handbook, etc.

It has been suggested, from time to time, that this Committee should be replaced by a further whole-time official, but I should resist this to the utmost, as I consider it a dangerous and unnecessary movement. I feel quite sure that it would not make the *Record* any better, but that it would be just as likely that the reverse would be the case.

Animal Dispensaries.—During the last few years, schemes have been put forward for the treatment of the animals of poor people. Discussions have taken place in all the Divisions of the N.V.M.A., and arrangements with the R.S.P.C.A. have been satisfactorily agreed upon in a large number of cases, either by the institution of a dispensary with veterinary surgeons in the area taking it in turn to be present at stated times, or by what is termed the Decentralised System, where animals are brought to the veterinary surgeon's premises for treatment. It will only be a question of time before every district in the whole country will be served by one or the other of these schemes, and I must say that we as a profession should do all we can to further the work, and not put any obstacles in the way of ensuring its success.

Benevolent Societies.—I have just been looking through the annual reports of the two veterinary benevolent societies, and I really do not know what we should do without them. The work that they do is very valuable indeed, and we should support them as much as ever we can.

It is very comforting to think that there are such organisations in being, for every case brought to their notice receives the most careful consideration, and their work is only hampered very often by lack of funds.

In 1932, the Victoria Veterinary Benevolent Fund made grants amounting to £1,170 to necessitous cases, whilst the National Veterinary Benevolent Society paid out £336.

Future of the Veterinary Profession.—I do not think that it will be out of place to refer for a few moments to the future of the Veterinary Profession. I must say at the outset that I am an optimist with regard to this, and am convinced that we as a profession are bound to be required even more in years to come than we have been in years gone by. The character of our work, however, will no doubt undergo a considerable change.

Whole-time appointments are being created in increasing numbers every year in every direction, by counties and boroughs, and by the government at home and in the colonies. New graduates are taking up this class of work in preference to going into private practice, because they recognise by so doing that the duties perhaps are not so arduous, the income is more secure, and the further outlook is more settled.

If the report of the Reorganisation Commission for Milk is adopted, whole-time officials must be increased by the hundred, and whilst this will take away the duties at present carried out in many districts by part-time veterinary officers, and decrease their practice to an alarming extent, it must mean the employment of more veterinary surgeons in the long run. I will not say more about this question, because we have a discussion on the subject later in the afternoon.

Veterinary surgeons in essentially rural areas have had a thin time just lately, and from what I have just said, there are no prospects of an improvement in the near future.

Those in cities and towns, although the horse has disappeared to a large extent, are not so badly affected, because of the very large increase in the numbers of small animals kept as pets, and for showing, since the war ended, and I see quite

a good outlook for them for some years to come, if they are alert and move with the times.

Perhaps it is not so impossible as some people imagine, that there may be a State Veterinary Service created somewhat after the style of the Panel System, and if it would do us as much good as it has the medical profession, then I do not think that we should fight against it as much as the doctors did when it was first introduced.

I fear that I have taken up too much of the time with this address, but I will conclude by saying that I do not think there ever was a time when it was so necessary to keep our motto, *Vis Unita Fortior*, always before us and to live up to it as well.

Next Meeting.—It was decided that the next meeting of the Division should be held at Taunton in October.

The report of the Reorganisation Commission for Milk was discussed, and the Secretary was instructed to write the N.V.M.A. to the effect that the Division considered that the veterinary inspections in connection with dairy cattle should be carried out by local veterinary surgeons working under a small committee of veterinary surgeons in each county, the Chairman of this committee of part-time officers to be responsible to the County Council concerned. Two inspections per annum were suggested.

Paper.—Mr. C. V. Watkins, M.R.C.V.S., D.V.S.M., then gave a paper on "Fowl-Pox and it Differential Diagnosis."

[This paper is reproduced, together with a report of the ensuing discussion, elsewhere in this issue.—Ed., *V.R.*]

Clinical Cases and Specimens.—Mr. R. H. Smythe exhibited the right fore foot of a cow. One of the claws showed an extensive keratoma.

Mr. Townson described the head of a foal which was born with a twisted palate and nasal bones.

Votes of Thanks.—At the conclusion of the meeting thanks were accorded to the President for conducting the meeting, and for his kindness in providing high tea for the members.

Votes of thanks were given to the essayist for presenting the paper on fowl-pox, and to the members who brought specimens and described cases of interest.

S. J. Motton, *Hon. Secretary.*

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ROYAL COUNTIES V.M.A.

SUMMER MEETING AT THE ROYAL AIR FORCE CAMP, HALTON*

The Summer Meeting of the Royal Counties V.M.A. was held at the Royal Air Force Camp, Halton, near Wendover, by kind permission of Air Vice-Marshal N. D. K. MacEwen, C.M.G., D.S.O., on Friday, August 4th, 1933.

The President, Captain H. B. Collet, presided, and the following members attended: Messrs. H. Bell, J. Bell, Major J. J. Dunlop, Captain J. R. Hewer, Mr. Tom Lepper, Dr. Leslie Sheather, Lieut.-Colonel J. P. Simpson, and Major F. J. Taylor. Visitors were: Dr. and Mrs. John Bell, Mrs. Collet, Mr. T. R. Hewer, Mrs. Lepper, Miss Sheather, Mrs. Simpson, Mr. Taylor, and Mr. W. J. B. Watson.

Business Meeting

The minutes of the previous meeting, having been published in the *Veterinary Record*, were taken as read. The President was also authorised to sign the minutes of the January meeting, the signing of which had been deferred at the April meeting in accordance with Lieut.-Colonel P. J. Simpson's proposal.

Before proceeding further with the business, the President made reference to the loss which the Royal Counties had sustained (since the last meeting) through the death of Mr. Ernest Wilkinson, of Witney. Mr. Wilkinson had been a regular attender of the Association's meetings, and this year had been elected a member of Council.

The members signified their respect for the memory of Mr. Wilkinson by standing for a moment in silence.

Correspondence.—(1) The following members wrote apologising for inability to attend: Messrs. J. H. L. Addis, A. J. and and J. R. Baxter, Captain R. E. C. Bullen, Mr. J. Carless, Captain J. C. Coleman, Mr. P. Crosfield, Major G. W. Dunkin, Lieut.-Colonel H. Greenfield, Major R. C. G. Hancock, Sir Frederick Hobday, Captain T. M. C. Hunt, Messrs. G. E. and W. S. King, Captain W. L. Little, Mr. Harry Lepper, Messrs. John McIntosh, John McKerlie, G. P. Male, N. P. Male, General Sir John Moore, Mr. H. C. Shingler, Major Slocock, Lieut.-Colonel P. W. Dayer Smith, Mr. F. T. Trewin, Captain Sydney Villar, Colonel G. K. Walker, Major R. F. Wall, Mr. F. W. Willett, Mr. R. A. Willett, Captain E. C. Winter, and Captain D. Wyllie.

(2) The Secretary read two letters from the Organising Committee of the National V.M.A. (1) calling attention to an extract from a letter received from the R.S.P.C.A., to the effect that they (the R.S.P.C.A.) were willing to pay a special fee to veterinary Surgeons (working in the scheme for treating sick animals of the poor) who may be called upon to attend accident cases at some distance from their surgery; (2) directing attention to the procedure which has been adopted by the Committee in several instances, with beneficial results, of inserting counter-advertisements in local newspapers in which had appeared intimations that some unqualified person was prepared to treat sick animals. The Committee sought in these instances to point out to the public how members of the Royal College might be distinguished from the unqualified. The letter signified the Committee's willingness to

* Received for publication, August 29th.

take similar action in any case to which members might call attention.

(3) From the Royal College of Veterinary Surgeons, intimating that the Council, acting on the advice of the Library and Finance Committee, were reluctantly compelled to withhold permission to hold any further large meetings in the Library of the Royal College on account of the increasing weight of books in the library, and the consequent strain upon the structure of the building.

Election to Membership.—Mr. A. E. Payne, F.R.C.V.S., proposed by Lieut.-Colonel P. J. Simpson, and seconded by Mr. G. P. Male, was unanimously elected to membership.

Place of Next Meeting.—It was resolved to hold the next meeting in London.

Resignation.—The Secretary intimated that Captain E. C. Winter wished to resign his membership, owing to ill-health. The meeting accepted Captain Winter's resignation with regret.

The President informed the meeting that Mr. N. S. Barron, who had been appointed the Association's delegate to attend the Congress of the Royal Sanitary Institute, at Blackpool, had, unfortunately, been taken ill (not seriously) on the day previous to the opening of the Congress, and consequently had not been able to attend.

This concluded the business.

Inspection of the Camp.

The party, joined by the ladies, then set out to inspect the Camp. Some thousands of men are trained here annually for the Royal Air Force. Unfortunately, the workshops were closed down for the annual summer holiday; nevertheless, the members and their visitors saw much to interest them in visiting the various departments of the school, and were able to examine many objects of handiwork executed by the trainees in the course of their instruction. Several types of aircraft were to be seen: some obsolete types, and some as used by the Air Force of to-day.

The party afterwards repaired to Wendover, where they were entertained to tea by Captain and Mrs. Collet, on the lawn of the Red Lion Hotel.

Votes of Thanks.—Dr. Leslie Sheather proposed a very hearty vote of thanks to Captain and Mrs. Collet for their hospitality—which was received with acclamation by the members. Dr. Sheather said that he thought the best thanks of the Association were due to Air Vice-Marshal MacEwen, by whose permission they had been able to visit and see over the Royal Air Force Camp at Halton. Also to Mr. Newman, and Flight-Lieut. Weedon, who had escorted the party.

The Secretary was instructed to write and convey the thanks of the Association to Air Vice-Marshal MacEwen. H. Bell, *Hon. Secretary.*

Alleged Lightning-stroke Injury

Lancashire V.M.A. Form of Enquiry

We publish below the particulars contained in a form of enquiry which has been drawn up by a special committee of the Lancashire Division, N.V.M.A., for use in investigating cases of injury from alleged lightning-stroke.

Copies of the form may be obtained upon application to Mr. A. L. Mullen, Hon Secretary of the Lancashire Division, N.V.M.A., Department of Veterinary Pathology, University of Liverpool, 42 and 44, Bedford Street, Liverpool, N.

ENQUIRY INTO ALLEGED LIGHTNING-STROKE INJURY

General

1. Name of owner of animals.
2. Full address and telephone number.
3. Date and time of visit.
4. Species of animals; breeds; ages; sexes and descriptions.
5. Number exposed; number uninjured; number injured; alive and dead.
6. Approximate value of each before the accident.
7. Condition when last seen alive and by whom.
8. Date and time when injury was discovered and by whom.
9. Place; position; ditch; trees; cables or wire.
10. Verification of lightning. By police or local meteorologist. Date; time; distance; severity.
11. Have any trees been struck (poplar, oak, elm, conifer, walnut, ash and beech, in order given)?
12. Are there any fish dead (in nearby ponds or streams. Exclude parasites and poisons)?
13. Are there any poisons or poisonous plants present (pasture, streams, ponds, hedges, trees)?
14. Have any of the animals been recently clipped, shorn, dipped or dressed?
15. Have any buildings been struck (susceptible in proportion to height, size, construction, etc.)?
16. Are any living animals showing nervous or other symptoms?
17. Sub-soil (loam, sand, clay, marl or chalk)?
18. Name of Insurance Company; address; number and date of policy.
19. Name of agent; address and telephone number.
20.
21.

External Examination.

22. Look for evidence of sudden death (grass between teeth, etc.).
23. (*a*) Exclude anthrax and other septicæmias by microscope. (*b*) Look for subcutaneous emphysema (blackquarter). (*c*) State of putrefaction (may set in very early).
24. What was the state of the natural orifices?
25. (*a*) Degree of *rigor mortis* (often slight and fleeting). (*b*) State of muscles of jaw (lockjaw)?
26. Are there any wounds (as if caused by blunt object, with dark or bluish-black flesh). Sometimes lacerated—clean cut, irregular, deep or superficial.
27. Exclude actinobacillosis of skin.

28. Is there any singeing or smell of burnt hair (90 per cent. of cases said to have it. Malicious)?
29. Are there any fractures or dislocations (spine, limbs). If present, ascertain causation.
30. What is the body temperature (elevated for some hours after death)? Exclude tetanus, strychnine poisoning and electric shock.
31. Is there any possibility of electric shock from an earth wire or leakage to earth? (A low voltage is sometimes sufficient to cause death.)
32.

Post-mortem Examination

33. Notify Insurance Company when and where. Never destroy carcass; if possible get a colleague to be present.
34. Give the state of the carcass with regard to nourishment.
35. Is there any subcutaneous hæmorrhage (bruising and dark blood)?
36. Note the appearance of skeletal musculature.
37. State the condition of the digestive apparatus: mouth and œsophagus (choking), stomachs (rupture and poisons), small intestine, large intestine, liver (amyloid); spleen, kidney, hæmorrhage. If in doubt save material for analysis. (Ruptured stomach may be due to lightning stroke.)
38. Describe the state of the respiratory apparatus. Trachea (asphyxia) lungs, pleura, heart (right side full, left empty and petechiæ in last three. Asphyxia can result from lightning.)
39. Are the brain and its vessels normal?
40. Exclude pregnancy or parturition.
41. Is there any intercurrent disease such as tuberculosis, liver fluke, or parasitic conditions?
42. Was the animal stampeded into fatal injury?
43. What amount will the carcass realise?
44.
45.

The following remarks also appear upon the form, which concludes with a suggested certificate (to be forwarded with a suitable letter or brief report) and a further form for the entry of particulars as to the species, breed, name, colour, sex, height, and market value of the animals concerned:

"With definite signs, and history, certification presents little difficulty. With a negative investigation, doubtful reports of lightning at a distance, and the presence of intercurrent disease or a state of pregnancy, it is difficult and it is only possible to state that death does not appear to have been due to the lesions present and that it might have been due to return shock.

"Where there has been a storm and the findings are negative, one can perhaps go a little further and say 'death might well have been due to lightning.'

"Complete notes should be kept with copies of certificates."

RHUBARB POISONING IN THE GOAT

Mr. G. O. Tomlin, M.R.C.V.S., of Woodbridge, writes: "With reference to Mr. Buchanan's communication appearing in your issue of the 23rd inst., there is a record of rhubarb poisoning in the goat in that of April 9th, 1932."

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

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DIARY OF EVENTS

Oct. 2nd.—N.V.M.A. Committee Meetings, at 2, Verulam Buildings, Gray's Inn, W.C.1: Appointments, 2 p.m.; Organising, 3 p.m.; Veterinary Officers' and Public Health, 4.15 p.m.; Parliamentary, 5.15 p.m.

Oct. 3rd.—N.V.M.A. Committee to make nominations for Standing Committees for 1933-34: 10 a.m., at 2, Verulam Buildings, Gray's Inn, W.C.1.
N. V. M. A. Council Meeting: 2.30 p.m., in the Library of Conway Hall, Red Lion Square, W.C.1.

Oct. 3rd.—Opening of Session, London, Edinburgh, Liverpool and Dublin Veterinary Colleges.

Oct. 4th.—R.C.V.S. Committee Meetings.

Oct. 5th.—R.C.V.S. Registration Committee.

Oct. 6th.—R.C.V.S. Committee and Council Meetings.

Oct. 9th.—Meeting of the Editorial Committee, N.V.M.A., at 2, Verulam Buildings, Gray's Inn, W.C.1, at 4.30 p.m.

Oct. 12th.—Meeting of the Lincolnshire and District Division, N.V.M.A., at Lincoln.

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ANNUAL GENERAL MEETING: HONORARY OFFICER CHANGES

Elsewhere in this issue we record the success which attended the Congress of the Association held at Llandudno from September 18th to 22nd, and we shall shortly be publishing, in an enlarged number, a full account of the proceedings. Mention should be made here, however, of two features of outstanding importance in connection with the Annual General Meeting, in that after three years' devoted and able service as President of the Association, Lieut.-Colonel P. J. Simpson, D.S.O., T.D., J.P., F.R.C.V.S., passed the chain—and cares—of that high and exacting office to Mr. William Nairn, M.R.C.V.S., of Blairgowrie, while the members were also called upon to accept—as they did with equal regret—the departure from the post of Hon. Secretary of another N.V.M.A. stalwart in Mr. J. W. McIntosh, M.R.C.V.S., F.R.S.E., whose position was filled by Captain J. R. Rider, M.R.C.V.S. In extending our congratulations to the newly-elected officers, we can pay no greater tribute to the wisdom of members in their choice than to express our confidence in the maintenance by Mr. Nairn and Captain Rider of the magnificent standard of capable and self-denying endeavour on behalf of the Association set by Lieut.-Colonel Simpson and Mr. McIntosh.

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PERSONAL

Marriages.—Comer—Furlong.—At Davidstown Parish Church, Co. Wexford, Irish Free State, by the Rev. T. Furlong (brother of the bride), E. A. Comer, M.R.C.V.S., D.V.S.M. (Vict.), of Birmingham, to Katherine Furlong, of Temple Scoby, Enniscorthy, Co. Wexford. Mr. A. L. Mullen, M.R.C.V.S., D.V.S.M. (Vict.), was best man. The bridegroom, who is a member of the Birmingham County Veterinary Department staff, was recently appointed an Assistant Veterinary Inspector for the Cheshire County Council.

Stobo—Evans.—At Christ Church, Brondesbury, London, T. Whyte Stobo, M.R.C.V.S., youngest son of Mr. and Mrs. James Stobo, South Garngour, Lesmahagow, Scotland, to Miss Betty Evans, eldest daughter of Mr. and Mrs. G. L. Evans, of London, and Maesyrhaf, Lampeter.

Dr. E. Jones, St. Thomas's Hospital, London, was best man, the groomsmen being Mr. Ian Gillespie, M.R.C.V.S., and Mr. George Owen.

After the ceremony a reception was held at 24, Sidmouth Road, Brondesbury, the residence of Mr. and Mrs. A. Gibbs. The honeymoon is being spent in Devon and Cornwall.

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R.C.V.S. OBITUARY

Barraclough, Thomas William, the Manor House, Lower Wyke, near Bradford. Graduated N. Edinburgh, December 16th, 1889; died September 13th, 1933, aged 68 years.

Hodgson, William, "West Croft," Brigham, Cockermouth, Cumberland. Graduated Glasgow, April 27th, 1885. Retired 1931. Died September 20th, 1933, aged 68 years.

Hopps, Robert, Captain late R.A.V.C., 70, Low Hill, Liverpool. Graduated Liverpool, July 16th, 1910; died September 17th, 1933, aged 49 years.

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UNDULANT FEVER: EARL WINTERTON'S PLEA

Earl Winterton, of Chiddingfold, writing in *The Times* of Tuesday last, speaks of the interest with which he read Sir Weldon Dalrymple Champneys' reference at the recent Congress, N.V.M.A., to the prevalence of *Brucella abortus* in the milk supply of the country, in consequence of a personal experience of an attack of undulant fever, the facts of which he proceeds to relate. "The whole question," he concludes, "demands the most urgent attention, both of the Ministry of Health and of the Ministry of Agriculture.* No one, least of all a Member of Parliament representing a rural constituency, wishes (if it can be avoided) to place further restrictions upon the milk industry. But it is in the interests of the industry itself that steps should be taken to deal with the situation in the light of recent research and discovery."

[*In May, 1932, the Agricultural Research Council, after a conference attended by representatives of the Medical Research Council and the other Government Departments concerned, appointed a committee, who are now engaged on the investigation of this problem.—Ed., *V.R.*]

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ARMY VETERINARY SERVICE

London Gazette—War Office—Regular Army

Sept. 19th.—The follg. Lts. to be Capts. (Sept. 19th):—L. W. Coulden, J. V. Tevlin, R. K. Kent, A. A. Kidd.

Territorial Army

Sept. 26th.—Maj. and Bt. Lt.-Col. J. A. Dixon, T.D., vacates the appt. of D.A.D.V.S. of a Div. (Sept. 1st).

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

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HYDROPS AMNII IN A COW

To the Editor of the Veterinary Record

Sir,—I was interested in Mr. Conisbee's case, reported in your issue of 16th inst., as I have recently treated a similar one.

A farmer friend of mine sent for me on August 17th last to attend a cow at one of his farms, as she was "enormously swollen."

On arrival I passed the probang to relieve tympany, if any, but with no result, and examination *per rectum* and *per vaginam* indicated enormous distension. I then passed the trocar and canula into the left flank and drained off many gallons of clear fluid. After I had remained for some time the canula was left in position with several attendants exercising pressure on the abdomen. The flow continued for hours and the owner returned the canula to me next day, reporting that the cow was very dull. Stimulants and tonics were prescribed, and on visiting the cow on August 24th I found her apparently normal, having aborted twin dead calves the previous night with large quantities of fluid, and she has continued to do well ever since.

I fully expected that she would require "tapping" again and was very doubtful as to her recovery, but fortunately no ill-effects arose and the expulsion of the calves obviated the necessity for further treatment.

W. T. Olver, M.R.C.V.S.

The Shrubberies,
Tamworth.
September 16th, 1933.

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MILK

To the Editor of the Veterinary Record

Sir,—There seems to be a lot of loose talk in the air about this subject. When doctors begin to talk and write about bovine subjects they make quite as many mistakes as the small number of modest veterinarians who dilate on human ailments and the entourage of mankind, and ("tell it not in Gath") some of their conclusions are only so much "tosh." Not a few of the medical men only advocate the mechanisation of milk and seem to overlook altogether the source of the milk supply and the veterinary supervision of it. One doctor at the British Association meeting is reported to have said that reports from cities with compulsory pasteurisation (for some years) showed that the hygienic methods of handling milk at the farm had shown a definite improvement since *processing* (? pasteurisation) became obligatory. One would like to have exact particulars as regards this general statement,—

Does it apply to this country or to America? In most cases the clarifier might contradict this statement. Besides, hygienic methods of *handling the cow* are quite as important as *hygienic methods of handling the milk.*

We are perhaps too credulous as regards America's freedom from tuberculosis. If the milk received for pasteurisation is so carefully produced, why bother about a suitable pre-pasteurisation bacterial count? This remark of the doctor's seems to convey the impression that he himself was doubtful about the accuracy of his previous contention.

Yours truly,

G. Mayall, m.r.c.v.s.

Bolton.

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FOWL-PARALYSIS RESEARCH

To the Editor of the Veterinary Record

Sir,—Since, on previous occasions, I have discussed in the *Veterinary Record* the pathology of neuro-lymphomatosis, you will perhaps kindly allow me to state my personal opinion, more particularly as to the value of the researches reported in two publications issued by the Poultry Pathological Research Laboratory of Goring, both dealing with fowl-paralysis. It is true that these communications have not appeared in veterinary journals, but the reason for this letter is easily explained. Farmers and breeders all over the country must decide whether fowl-paralysis is present in their stock or not, as the outcome of statements by institutions similar to that mentioned and if harm is to be avoided it is absolutely necessary that the diagnosis should be as exact and reliable as the present state of knowledge permits. The poultry keeping community cannot discriminate between various qualifications and to judge a tree by its fruits is a laborious and expensive method.

The first paper, dated June, 1932, shows on page 39 the section of a nerve with the legend: "Fowl-paralysis nerve from chick aged four weeks exhibiting moderate infiltration. C.C.—infiltrating cells." I refuse to admit that these lesions would allow anyone versed in the histology of the disease to diagnose neuro-lymphomatosis and so the statement that genuine fowl-paralysis has been detected in chicks as early as at four weeks of age (much earlier than anyone else), I contend, is accordingly erroneous. I may add that a moderate diffuse infiltration with lymphoid cells is present in the nervous system of chicks (and young animals in general), as every pathologist worth the name should know.

The other illustrations to which I take exception are found in a paper read at the Harper Adams Conference in August this year, the illustrated text of which lecture was then handed to the audience. Here we are dealing with a somewhat more complicated matter, for pathological lesions are unquestionably present in some of the sections shown, but their significance is quite different from that stated, for some are definitely not typical of neuro-lymphomatosis. In a few plain words, what appears in Fig. 4 is an organised thrombus in a dilated capillary of the brain, with a minute newly-formed capillary taking part in the process of vascularisation known to every trained anatomist. The legend attached states: "Perivascular infiltration of vessel in the brain (× 450)," but the lesion is emphatically not typical of acute paralysis, in which a peculiar "cuff" develops around certain cerebral arterioles, and which I illustrated some time ago in the *Veterinary Record.* This cuffing, I admit, is a capricious reaction and one which, one must concede, does not occur regularly in genuine fowl-paralysis, the lesions of which are predominantly to be found in the peripheral nervous system and usually are more intense in the interstitial spaces between single neuron-axis sheaths.

As stated, the paper was read at the Harper Adams Conference and at the time I did not think that the time or occasion were suitable to register dissent, either in relation to the interpretation of several sections or of the results of the experiments; the same view was held by my veterinary colleagues who were present, and whom I consulted. Still, since the histological work appears inaccurate, one may perhaps infer that the experiments founded on such sections may allow alternative interpretations to those put forward by the joint authors; more particularly as the easy transmission of genuine fowl-paralysis is negatived by all trained pathologists.

Yours, etc.,

H. P. Bayon.

Cambridge.

September 15th, 1933.

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"*VIS* UNITA *FORTIOR*"! ONCE MORE

To the Editor of the Veterinary Record

Sir,—I have no doubt that the sponsors of the proposed "Veterinary Practitioners' League" have the best of motives; but is it necessary or advisable to start a new league or association of any sort?

I am only a common or garden country practitioner and have no axe to grind, but I somehow feel convinced that the N.V.M.A. is doing its best to safeguard the honour and interests of the profession in every direction and would it not be better to put the steam necessary to start a new league into the old one and increase the pressure, rather than decrease it by opening a side valve?

I am afraid all this is rather crudely put; but one of the objects of the V.P.L. is stated to be to obtain "a real unity of the whole profession," and this scheme, praiseworthy as it may be, hardly seems like union.

Yours faithfully,

J. R. Baxter.

Downington House,
Lechlade,
Glos.

September 17th, 1933.

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DRUGS AND INSTRUMENTS: SALE TO LAYMEN

To the Editor of the Veterinary Record

Sir,—I am writing you on behalf of that branch of our profession which has a harder life and more ups and downs than any other—I refer to the country practitioner.

With the present depression, the farming community are endeavouring to cut down all surplus expenses, and unfortunately both for the farmer and ourselves, some of that community are not so ready to call us in as they have been in the past. In place of the veterinary surgeon the farmer consults the local chemist. The local chemist does not see the case, but prescribes according

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to the farmer's diagnosis. This diagnosis may be wrong, and as the case slowly gets worse the veterinary surgeon is then called in. By that time the case has become hopeless, and as the veterinary surgeon can do nothing, he is the one to be blamed.

For a time it is satisfactory to the farmer that our bills are less, but he fails to realise that he himself is the loser, owing to his resultant loss of stock. Moreover, thanks to the patent medicine vendors, the agricultural chemists and the cheaper instrument companies, our own incomes are becoming less and our prestige is being gradually lowered.

Whether all of us shall regain that prestige in the future remains to be seen, but I would suggest that we should at least take some sort of action.

As a profession, we receive the support of many excellent drug and instrument firms, many of which limit their activities to professional men only. As they have supported us in the past, so should we support them in the future, and not, as is now the case, classify them in the same category as patent medicine vendors by allowing their advertisements to appear side by side in our own official journals with those of what might be termed "quack" firms. For instance, there is one firm, who regularly advertise in the *Record*, who even supply "Record" syringes and swine erysipelas serum to farmers directly. The same firm regularly offers to farmers directly a multitude of veterinary instruments and patent medicines.

I would suggest that a strict censorship be immediately placed on such and similar firms and that their advertisements should no longer appear in our journals; and, moreover, that we should no longer give them our support.

Yours faithfully,

H. C. Swann.

London Road,
King's Lynn.
September 4th, 1933.

JENNER'S VETERINARY STUDENT HELPER

To the Editor of the Veterinary Record

Sir,—Upon what I thought, at the time, might have been obscure veterinary history, I recently wrote to Dr. Bullock, with the object of obtaining some information of the subsequent career of one Tanner, who as a veterinary student in 1799, assisted to secure the first important stock of cow-pox material for vaccination: the scene was a dairy in *Gray's Inn Lane*. The book from which the information is obtained is "Jenner and Vaccination." Charles Creighton, M.D., 1889. (Swan Sonnenschein.) References to Tanner's participation are on pages 98, 103, *et seq.*, 113. Dr. Bullock's letter is attached for your reference.*

Yours faithfully,

L. J. Kelly.

22, Liverpool Road,
Worthing.
September 13th, 1933.

* Dr. Bullock informs our correspondent that Mr. Tanner qualified from the London College in 1799, and adds: "It is doubtful if we could get much further information about Tanner, for there was no veterinary periodical in existence until 1828. When I have time, however, I will see whether there is anything to be found in the medical journals of that time." [Perhaps one or more of our readers can assist.—Ed., *V.R.*]

The Editor acknowledges, with thanks, the receipt of the following:—

Communications from Mr. J. R. Cunningham (Prince Edward Island), Dr. J. T. Edwards (Lister Institute), Miss F. M. Holmes (Belfast), Mr. E. R. Jones (Veterinary Department, Uganda) and Captain W. L. Little (Reading).

Reports of meetings of the Eastern Counties and Lincolnshire and District Divisions, N.V.M.A., from Messrs. H. P. Standley, junr., and H. C. Reeks, junr., respective Hon. Secretaries.

Diseases of Animals Acts, 1894 to 1927

SUMMARY OF RETURNS

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 1st to 15th Sept., 1933	10	11	3	74	3	3	37	33	18
Corresponding period in									
1932	2	2	3	300	2	2	3	43	18
1931	15	17	4	397	8	37	4	70	30
1930	17	20	5	159	4	7	7	73	35
Total 1st January to 15th August, 1933	202	229	65	6,123	112	188	276	1,049	637
Corresponding period in									
1932	253	311	9	862	101	161	167	1,250	616
1931	353	397	94	10,307	114	210	211	1,384	581
1930	273	301	5	159	171	260	290	1,775	754

Note.—The figures for the current year are approximate only. § Excluding outbreaks in Army Horses.